



RESEARCH PAPER

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Consumer acceptability and market potential of a value-added mango fruit bar

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ABSTRACT

This study evaluated the consumer acceptability and market potential of a value-added mango fruit bar developed from fresh mango pulp. The product was prepared using ripe mangoes that were processed through blending, heating, and drying to produce a semi-solid fruit bar. A descriptive research design was employed, and sensory evaluation was conducted with 50 respondents using a nine-point hedonic scale to assess the product's color, aroma, taste, texture, mouthfeel, overall flavor, and overall acceptability. Purchase intention and qualitative consumer feedback were also gathered to determine the product's market potential and identify opportunities for improvement. The mango fruit bar received high ratings across all evaluated sensory attributes, with mean scores ranging from 8.12 to 8.44, corresponding to the verbal interpretation "Like Very Much." Overall flavor and overall acceptability obtained the highest mean score (8.44), followed by taste (8.36), texture (8.32), aroma (8.30), mouthfeel (8.14), and color (8.12). In addition, 88.0% of the respondents expressed a positive purchase intention, indicating that they would definitely or probably buy the product if it were commercially available. Qualitative feedback revealed that respondents particularly appreciated the product's natural mango flavor, chewy texture, and pleasant aroma, while minor improvements in texture and appearance were suggested. The findings indicate that the developed mango fruit bar is highly acceptable to consumers and has promising market potential. As a value-added mango product, it offers an alternative means of utilizing surplus mangoes, reducing postharvest losses, and creating opportunities for product diversification and agribusiness development.

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INTRODUCTION

Mango (*Mangifera indica* L.) is one of the most important tropical fruit crops because of its high nutritional value, consumer appeal, and economic contribution. It is a rich source of vitamins A and C, dietary fiber, and bioactive compounds with antioxidant properties that promote human health (Food and Agriculture Organization [FAO], 2023). Mango is widely cultivated in tropical and subtropical regions, where it contributes to food security, agricultural production, and the livelihoods of farming communities (Jedele *et al.*, 2003).

In the Philippines, mango production remains an important component of the horticultural sector. The country is internationally recognized for producing premium-quality mangoes, particularly the Carabao variety, which is valued for its sweetness and distinct flavor.

According to the Philippine Statistics Authority (2024), the country produced approximately 763,000 metric tons of mangoes, making it one of the country's leading fruit commodities.

Despite its economic importance, mango production continues to face challenges associated with seasonal oversupply, inadequate postharvest handling, and limited processing opportunities. These constraints contribute to considerable postharvest losses, reducing both product value and farmers' income (Affognon *et al.*, 2015; Kitinoja and Kader, 2015).

Value-added processing offers a practical approach to addressing these challenges by extending product shelf life and creating additional market opportunities for surplus fruits.

Among the various processed mango products, fruit bars have gained attention because of their convenience, natural fruit content, and longer storage stability. Consumer demand for fruit-based snacks has also increased as more people seek healthier alternatives to highly processed snack foods (Tournas *et al.*, 2020). Developing value-added products from

locally available mangoes therefore provides an opportunity to improve fruit utilization while supporting small-scale food processing and agribusiness development.

The commercial success of newly developed food products depends largely on consumer acceptance. Sensory attributes such as color, aroma, taste, texture, and mouthfeel influence consumers' perceptions of quality and their willingness to purchase a product. Sensory evaluation provides a systematic method for measuring these attributes and determining overall product acceptability (Lawless and Heymann, 2010). Consumer feedback also provides valuable information for identifying product strengths and areas that require improvement before commercialization.

This study evaluated the consumer acceptability and market potential of a value-added mango fruit bar developed from fresh mango pulp. Specifically, the study assessed the product's sensory attributes using a nine-point hedonic scale, examined consumers' purchase intention, and gathered qualitative feedback to identify possible improvements that could support product refinement and future commercialization.

MATERIALS AND METHODS

Research design

This study employed a descriptive research design using consumer sensory evaluation to assess the acceptability and market potential of a value-added mango fruit bar. Consumer sensory evaluation is a widely accepted method in food product development for determining consumer preferences based on sensory attributes such as color, aroma, taste, texture, mouthfeel, and overall acceptability (Lawless and Heymann, 2010). A nine-point hedonic scale was used to measure the respondents' degree of liking for each evaluated attribute.

Preparation of the mango fruit bar

The mango fruit bar was prepared at the Food Processing Laboratory of Cagayan State University – Piat campus, following standard fruit leather processing procedures. Fresh, ripe mangoes were

used as the primary raw material in the preparation of the mango fruit bar. The fruits were thoroughly washed under running water to remove adhering dirt and other impurities, then manually peeled and deseeded. The mango flesh was blended to obtain a smooth and homogeneous pulp.

The mango pulp was combined with the required ingredients namely maltodextrin, sugar, citric acid, and sodium metabisulfite. The mixture was heated with continuous stirring until the desired consistency was achieved. It was then spread evenly onto drying trays at a uniform thickness and dried until a flexible, semi-solid fruit bar was obtained. After drying, the product was allowed to cool at room temperature, cut into uniform portions, and stored in clean, food-grade containers before sensory evaluation.

Respondents

A total of 50 respondents participated in the sensory evaluation through convenience sampling. The respondents consisted of individuals who were available and willing to participate in the study. They ranged in age from 18 to 27 years. Before the evaluation, the purpose of the study and the evaluation procedure were explained to all participants, and instructions on the proper use of the nine-point hedonic scale were provided to ensure consistent product evaluation.

Sensory evaluation

The sensory evaluation was conducted using a nine-point hedonic scale, where 1 corresponded to "Dislike Extremely" and 9 corresponded to "Like Extremely" (Stone and Sidel, 2004). Each respondent received a coded sample of the developed mango fruit bar and evaluated its color, aroma, taste, texture, mouthfeel, overall flavor, and overall acceptability using a structured sensory evaluation questionnaire. Drinking water was provided between evaluations to minimize residual taste and maintain the accuracy of sensory assessment.

Data collection

Data were collected using a structured questionnaire consisting of two sections. The first section contained

the nine-point hedonic scale used to evaluate the sensory characteristics of the mango fruit bar. The second section included open-ended questions that gathered respondents' feedback regarding the product's strengths, areas for improvement, and purchase intention.

Statistical analysis

The collected data were analyzed using descriptive statistics. Mean scores and standard deviations were computed to determine the level of consumer acceptability for each sensory attribute. Purchase intention and qualitative responses were summarized using frequencies and percentages. The computed mean scores were interpreted according to the verbal descriptions of the nine-point hedonic scale. Descriptive statistical methods were considered appropriate because the study aimed to determine consumer acceptability and market potential rather than compare treatment groups.

RESULTS AND DISCUSSION

Consumer acceptability of the developed mango fruit bar

Table 1 presents the sensory evaluation results of the developed mango fruit bar based on the responses of 50 participants using a nine-point hedonic scale. The product received favorable ratings across all sensory attributes, with mean scores ranging from 8.12 to 8.44. All attributes were interpreted as "Like Very Much," indicating a high level of consumer acceptability.

Among the evaluated attributes, overall flavor and overall acceptability obtained the highest mean score of 8.44. This finding suggests that the combination of taste, aroma, and texture created a positive eating experience for the respondents. Taste also received a high rating (8.36), indicating that the product successfully retained the characteristic sweetness and natural flavor of fresh mango. These findings are consistent with those of Lawless and Heymann (2010) and Meilgaard *et al.* (2016), who emphasized that flavor is one of the primary determinants of consumer preference for food products.

Table 1. Consumer acceptability of the developed mango fruit bar

Sensory Attribute	Mean	Standard deviation	Verbal interpretation
Color	8.12	0.89	Like Very Much
Aroma	8.30	0.84	Like Very Much
Taste	8.36	0.80	Like Very Much
Texture	8.32	0.85	Like Very Much
Mouthfeel	8.14	0.92	Like Very Much
Overall Flavor	8.44	0.76	Like Very Much
Overall Acceptability	8.44	0.78	Like Very Much

Table 2. Market potential of the developed mango fruit bar

Purchase intention	Frequency (n=50)	Percentage (%)
I will definitely buy	28	56.0%
I will probably buy	16	32.0%
Not sure if I will buy	6	12.0%
I will probably not buy	0	0.0%
I will definitely not buy	0	0.0%
Total	50	100%

Texture (8.32) and aroma (8.30) also received favorable ratings, reflecting respondents' appreciation of the product's chewy consistency and pleasant mango aroma. These characteristics are consistent with the expected sensory qualities of fruit leather products. Diamante *et al.* (2014) likewise reported that texture plays a significant role in consumer satisfaction because it influences the overall eating experience.

Color obtained the lowest mean score (8.12), although it remained within the "Like Very Much" category. This result suggests that while respondents found the product visually acceptable, improvements in color development or product appearance could further enhance its appeal. Visual appearance often shapes consumers' initial expectations of food quality before tasting the product (Stone and Sidel, 2004).

Overall, the consistently high ratings across all sensory attributes demonstrate that the developed mango fruit bar was well accepted by the respondents. The findings indicate that the product possesses desirable sensory qualities and shows promise as a value-added mango product with potential for commercial production.

Market potential of the developed mango fruit bar

Consumer purchase intention provides an initial indication of a product's potential acceptance in the market. As shown in Table 2, most respondents expressed a positive intention to purchase the developed

mango fruit bar. Of the 50 respondents, 28 (56.0%) stated that they would definitely buy the product, while 16 (32.0%) indicated that they would probably buy it. Only six respondents (12.0%) were uncertain, and none selected either of the negative purchase options.

The results show that 88% of the respondents expressed a favorable purchase intention, suggesting strong market potential for the developed product. This positive response is consistent with the high sensory ratings reported in Table 1. Consumers are more likely to purchase products that meet their expectations in terms of taste, aroma, texture, and overall eating quality.

Previous studies have shown that sensory acceptability strongly influences consumers' willingness to purchase newly developed food products (Meilgaard *et al.*, 2016). The high purchase intention observed in this study suggests that the developed mango fruit bar has good potential for commercialization, particularly as a value-added snack made from locally produced mangoes. Appropriate packaging, product branding, and marketing strategies could further increase its appeal to consumers and improve its competitiveness in the snack food market.

Consumer feedback and suggested product improvements

Table 3 summarizes the respondents' qualitative feedback on the developed mango fruit bar, including the attributes they liked, the aspects they considered

less desirable, and their suggestions for product improvement. Overall, the responses support the positive findings of the sensory evaluation and provide useful insights for further product refinement.

Among the positive attributes, the natural mango taste and flavor were the most frequently mentioned, with 42.0% of respondents identifying them as the product's best characteristic. This finding indicates

that the processing method successfully preserved the fruit's natural flavor, which contributed to its high ratings for taste and overall flavor. The chewy texture (20.0%) and pleasant aroma (10.0%) were also commonly appreciated, suggesting that these sensory characteristics enhanced the overall eating experience. Similar findings have been reported by Diamante *et al.* (2014), who noted that flavor and texture are among the primary factors influencing consumer acceptance of fruit leather products.

Table 3. Summary of Consumer Feedback and Suggested Product Improvements

Consumer feedback and suggested product improvements	Frequency (n=50)	Percentage (%)
Positive feedback		
Natural mango taste/flavor	21	42.0
Chewy texture	10	20.0
Pleasant aroma	5	10.0
Balanced sweetness	4	8.0
Attractive appearance	3	6.0
Pleasant mouthfeel	2	4.0
Other positive comments	5	10.0
Areas for improvement		
Reduce stickiness	7	14.0
Reduce excessive chewiness	5	10.0
Improve color appearance	2	4.0
Adjust aroma	1	2.0
Improve sweetness balance	1	2.0
Minimize aftertaste	1	2.0
No negative comments	33	66.0
Suggestions		
Improve texture and reduce stickiness	11	22.0
Enhance color or appearance	3	6.0
Adjust sweetness or flavor balance	2	4.0
Improve packaging or product form	2	4.0
Continue product development	1	2.0
No suggestions	31	62.0

Although most respondents expressed positive opinions, several areas for improvement were identified. The most common concern was the product's sticky texture (14.0%), followed by excessive chewiness (10.0%). A few respondents also suggested improving the product's color, sweetness balance, aroma, and aftertaste. Despite these observations, 66.0% of the respondents reported no negative comments, indicating that the developed mango fruit bar was generally well accepted.

The suggestions provided by the respondents were consistent with the identified concerns. The most frequent recommendation was to improve the texture by reducing stickiness or excessive chewiness (22.0%). Other suggestions included

enhancing the product's color, adjusting the sweetness or flavor balance, and improving the packaging or product presentation. More than half of the respondents (62.0%) did not provide any recommendations, reflecting their overall satisfaction with the product.

The qualitative feedback complements the sensory evaluation results by identifying specific product attributes that contribute to consumer satisfaction while highlighting opportunities for further improvement. Refining the texture and visual appearance without altering the product's natural mango flavor could further enhance consumer acceptance and strengthen its potential for commercialization.

CONCLUSION

The developed mango fruit bar demonstrated high consumer acceptability across all evaluated sensory attributes, including color, aroma, taste, texture, mouthfeel, overall flavor, and overall acceptability. The high mean scores obtained from the sensory evaluation indicate that the product possesses desirable sensory characteristics, with overall flavor and overall acceptability receiving the highest ratings.

The findings also revealed strong market potential for the developed product. Most respondents expressed a positive purchase intention, indicating their willingness to buy the mango fruit bar if it were commercially available. Qualitative feedback further showed that respondents appreciated the product's natural mango flavor, pleasant aroma, and chewy texture, while only minor improvements in texture and appearance were recommended.

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